Multi-Purpose Submerged Reef at Oil Piers in Ventura County, California for the National Erosion Control Development and Demonstration Program (Section 227)

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Oil Piers is located in northern Ventura County, California. The name refers to an extended series of piers terminating in offshore oil wells belonging to Mobile Oil Corporation that were removed in 1998. Prior to removal of the oil piers, the area offshore of Oil Piers was a popular surfing area, but the break was lost when the piers were removed. The piers had also sheltered the adjacent beaches from incident waves, and since the removal of the piers the beach has largely eroded back to a rock revetment protecting Highway 101.

The proposed solution to control the shoreline erosion is a multi-purpose submerged reef comprised of geotextile containment cells. The reef is designed not only to block wave energy from reaching the shoreline, but also to rotate the incident wave energy to approach the shore in a more shore-normal direction and reducing the longshore transport in the project area. Additionally, the reef is designed to produce a surfing break to restore the recreational benefits of the area, and providing ecological enhancements.

The design phase of the project has been completed and included six main components: field data collection, analysis of existing data and field data for development of an inshore wave climate, numerical modeling for design and assessment of functional performance, detailed construction methodology, and cost estimation and development of a performance monitoring program. The project also included environmental analysis and coordination with resource agencies.

Numerical modeling was used to develop the final Oil Piers reef design and to assess its functional performance. The final design is an "L-shaped" reef with an alongshore length of 123 meters located 200 meters offshore. Crest elevation is –0.5 meters Mean Lower Low Water (MLLW), and volume of the reef is 17,100 m^3 in 11 compartments. Each compartment is typically 50-ft wide by 140-ft long and constructed with a dual fabric geosynthetic material. The compartments will be positioned on the seabed and filled in-situ with a beach-compatible sand.

Functional assessment has confirmed that the combination of reef location, crest height, length, and orientation will provide both wave height attenuation and wave crest rotation resulting in sediment retention. The analysis has also indicated that the reef will produce surfing waves suitable for intermediate to competent surfers when incident waves are straight-crested and above 0.75 m.

The expected construction window is July – August 2006.

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Biographies

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